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10/564,566	01/13/2006	Michael Daniels	TFEL0001	2026

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EXAMINER	
PATEL, VINOD D	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/564,566
Filing Date: January 13, 2006
Appellant(s): DANIELS ET AL.

Steven W. Smyrski, Esq.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/26/10 appealing from the Office action mailed 12/09/09.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: Claims 1-3, 12, 13 and 17 are finally rejected and pending in the application.

(4) Status of Amendments After Final

No amendments were filed after the final rejection.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection

(if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

4,677,281	Mills	6-1987
3,222,497	W. H. Gordon, Jr	12-1965
6,492,629	Sopory, Umesh	12-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 12-13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mills (US4677281) in view of Gordon Jr (US3222497) and further in view of Sopory (US6492629).

Mills discloses a heating cable (Figure 2, column 3-4) comprising a first conductor (14) comprising a pair of conductors (15,16) which extends along the length of the cable; a second conductor (12) which extends along the length of the cable; a separation layer (17) which extends along the length of the cable and is interposed between the pair of conductors (15, 16), an outer insulating jacket (column 4, line 9, US 3222497, note, this info from Mills reference) extending along the length of the cable and around the first and second conductors and the separation layer wherein the first and second conductors are connected at a first end of the cable in series such that current can flow in both directions through the first and second conductors, the first and second conductors are connected at a second end of the cable to an AC power supply equal currents flow in opposite directions through adjacent portions of the first and second conductors, (column 4, lines 29-37, “The gate controlled bidirectional semiconductor switches 25, 26 are of the type which is sometimes referred to by the term "Quadrac" and are available from various manufacturers. The Quadrac" is a bistable semiconductor device triggered through an integral diac and which can block voltage in either direction**, conduct current in either direction**, and

be triggered for **conducting current in either direction** by the application of gate signals.") and wherein the separation layer is formed such that the separation layer has a negative temperature characteristic, and the first conductor is formed such that the first conductor has a positive temperature characteristic (column 6, line 51-51) reduces with increasing temperatures. Mills discloses a heating cable (Figure 3) comprising a first conductor (14') which extends along the length of the cable; a second conductor (12) which extends along the length of the cable; and an outer insulating jacket (column 4, line 9, US 3222497, note, this info from Mills reference) extending along the length of the cable and around the first and second conductors wherein the first and second conductors are connected at one end of the cable in series such that current can flow in both directions through the conductors, the first and second conductors are connected at the other end of the cable to respective poles of an AC power supply equal currents flow in opposite directions through adjacent portions of the conductors, and the first conductor is formed such that it has a positive temperature characteristic (column 6, lines 40-55). Mills utilize AC current, "AC current, **Flow of electric charge that reverses periodically**, unlike direct current. It starts from zero, grows to a maximum, decreases to zero, **reverses, reaches a maximum in the opposite direction, returns again to zero, and repeats the cycle indefinitely**. The time taken to complete one cycle is called the period (see periodic motion), and the number of cycles per second is the frequency; the maximum value in either direction is the current's amplitude. Low

frequencies (50–60 cycles per second) are used for domestic and commercial power, but frequencies of around 100 million cycles per second (100 megahertz) are used in television and of several thousand megahertz in radar and microwave communication. A major advantage of alternating current is that the voltage can be increased and decreased by a transformer for more efficient transmission over long distances. Direct current cannot use transformers to change voltage."

Mills does not disclose a separation layer in Figure 3 which extends along the length of the cable and is interposed between the first and second conductors; the separation layer has a negative temperature characteristic.

Mills does disclose a separation layer in Figure 2 which extends along the length of the cable and is interposed between the first and second conductors; the separation layer has a negative temperature characteristic.

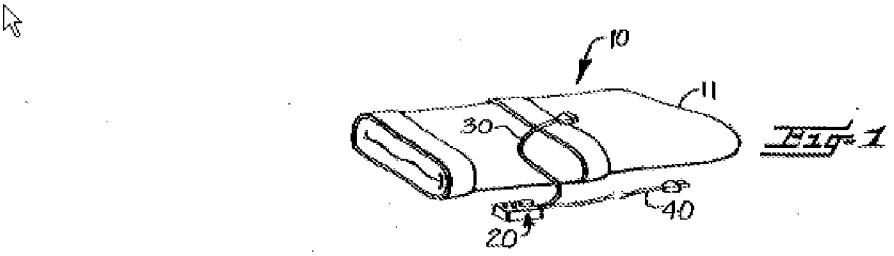


Fig. 1

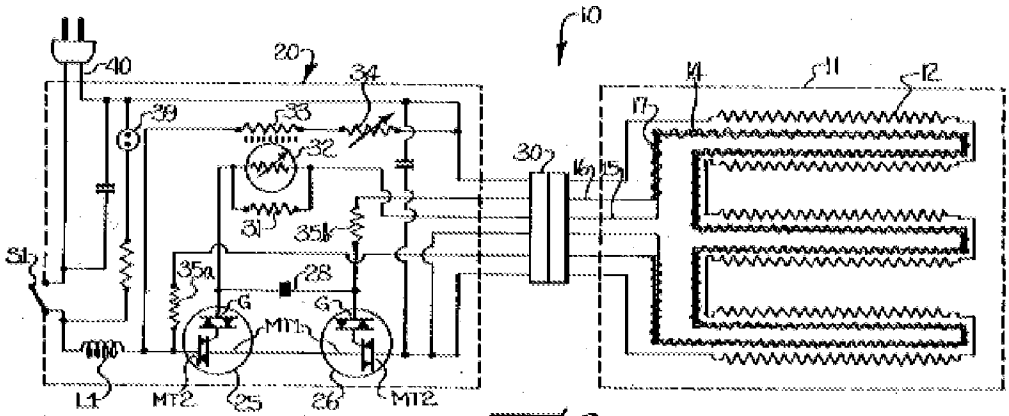


Fig. 2

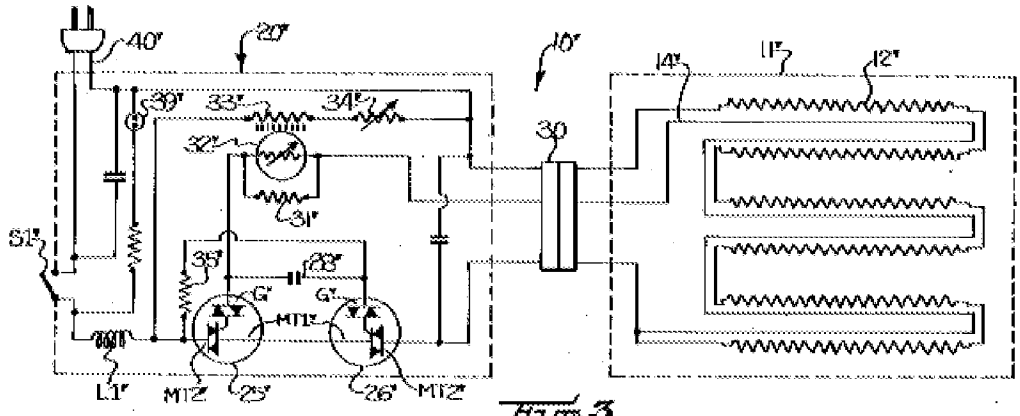


Fig. 3

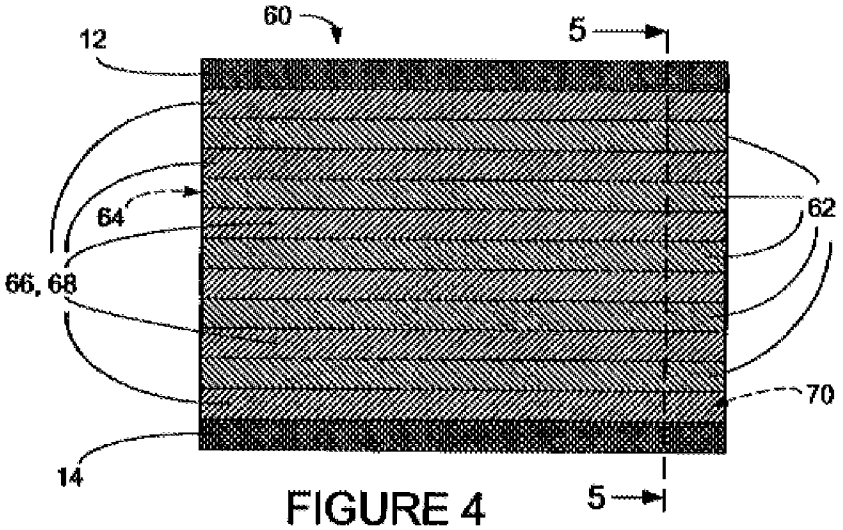


FIGURE 4

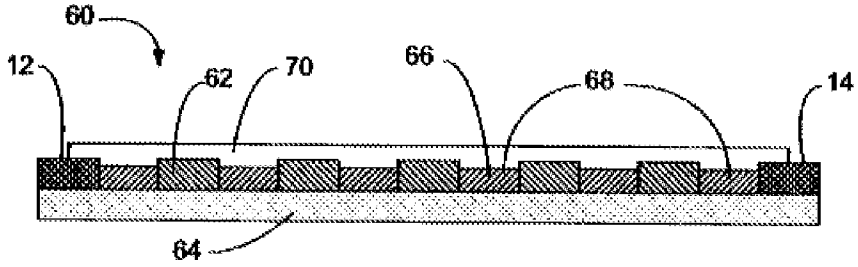


FIGURE 5

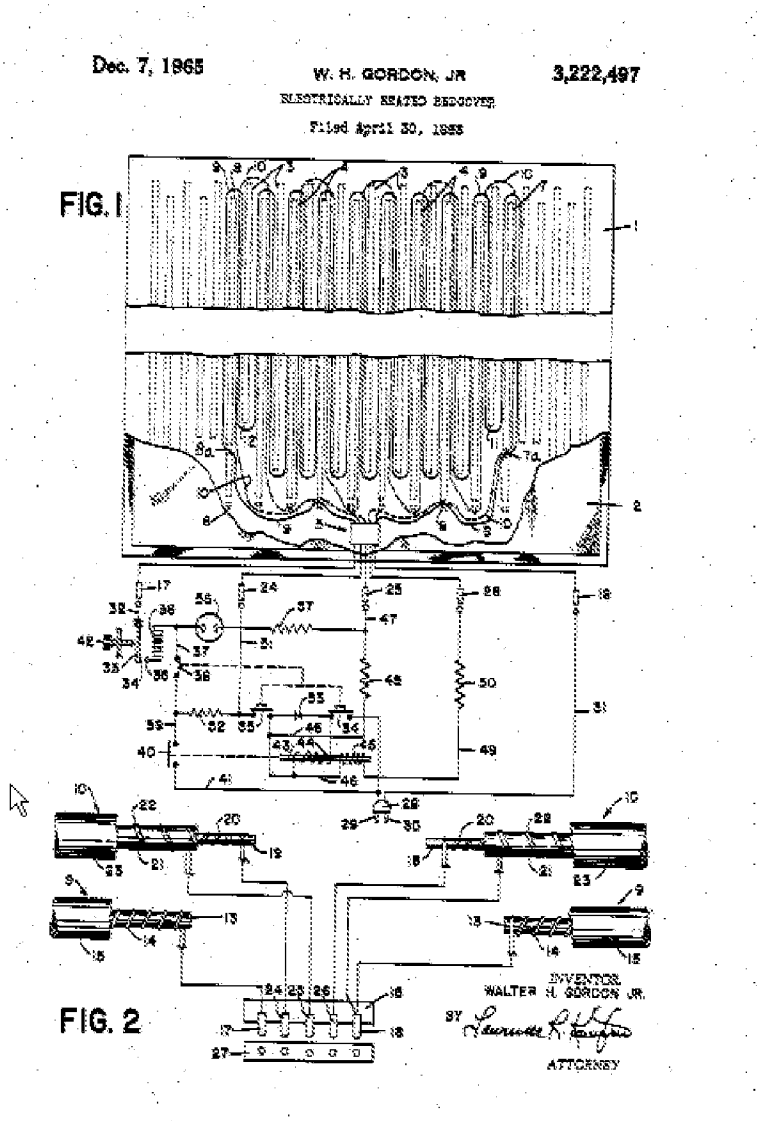
With respect to claim 2, the first and second conductors are coaxial and the separation layer is tubular, the first conductor being located inside the tubular separation layer and the second conductor being located outside the tubular separation layer (column 4, line 9, US 3222497).

With respect to claim 3, the first conductor is formed from twisted together components each of which comprises a fibre core (column 4, line 9, US 3222497) around which a positive temperature coefficient wire has been wrapped to form a helix.

With respect to claim 12, the second conductor is a heating wire wrapped around the tubular separation layer to form a helix.

With respect to claim 13, the second conductor is a heating wire wrapped around the tubular separation layer to form a helix.

With respect to claim 17, the separation layer is formed such that the separation layer melts if heated to a predetermined threshold temperature.



Gordon discloses a sensor wire and heating wires, the sensor wire comprising two spirals separated by NTC material (column 1lines 60-63).

Sopory teaches (column 2, lines 39-52, Figure 4) use of PTC and NTC or ZTC and/or VSM material for use in protection of electrical circuits.

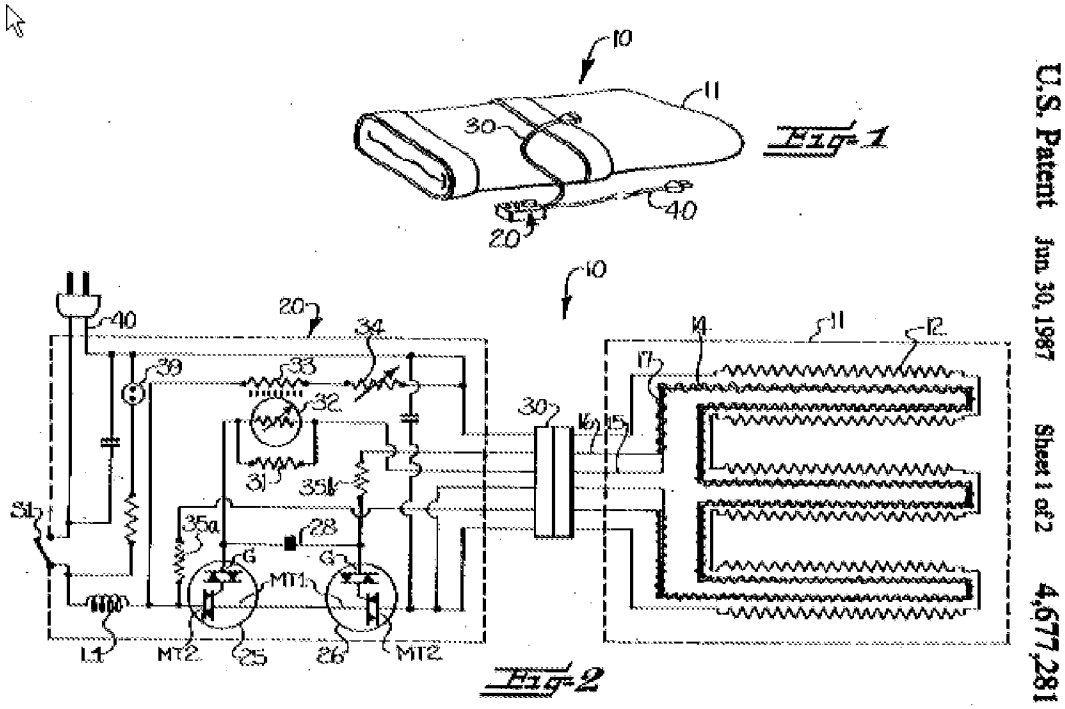
It would have been obvious to one of ordinary skilled in the art at the time of invention to use a sensor wire as taught by Gordon Jr and a separation layer between two conductors as taught by Sopory in order to protect electrical circuit for the heating cable of Mills by using PTC conductor and NTC separation layer.

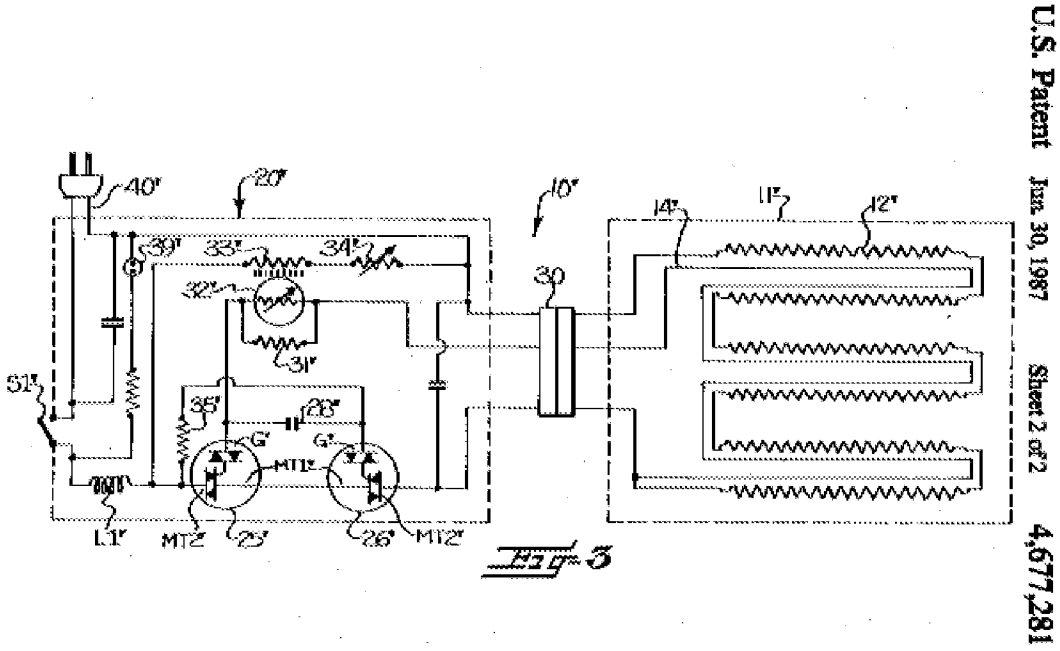
(10) Response to Argument

A. "equal currents flow in opposite directions through adjacent portions of the first and second conductors…

Examiner respectfully disagrees with Appellant with respect to Mills reference. Mills discloses in Figures 2 & 3, "when the first and second conductors are connected at a second end of the cable to an AC power equal flow in opposite directions through adjacent portions of the first and second conductors." Mills discloses, (column 4, lines 29-37, "The gate controlled bidirectional semiconductor switches 25, 26 are of the type which is sometimes referred to by the term "Quadrac" and are available from various manufacturers. The Quadrac" is a bistable semiconductor device triggered through an integral diac and which can block voltage in either direction**, conduct current in either direction**, and be triggered for **conducting current in either direction** by the application of gate signals."). Mills utilize AC current, "**Flow of electric charge that reverses**

periodically, unlike direct current. It starts from zero, grows to a maximum, decreases to zero, **reverses, reaches a maximum in the opposite direction, returns again to zero, and repeats the cycle indefinitely**. The time taken to complete one cycle is called the period (see periodic motion), and the number of cycles per second is the frequency; the maximum value in either direction is the current's amplitude. Low frequencies (50–60 cycles per second) are used for domestic and commercial power, but frequencies of around 100 million cycles per second (100 megahertz) are used in television and of several thousand megahertz in radar and microwave communication. A major advantage of alternating current is that the voltage can be increased and decreased by a transformer for more efficient transmission over long distances. Direct current cannot use transformers to change voltage."





Mills clearly discloses claimed limitations. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Appellant is repeating what is being disclosed by Mills. During examination, claim limitations are to be given their broadest reasonable reading. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

B. "….connected in series…"

Examiner respectfully disagrees with the appellant that Mills doe not disclose "…connected in series..." Mills discloses a heating cable (Figure 2, column 3-4) comprising a first conductor (14) comprising a pair of conductors (15,16) which extends along the length of the cable; a second conductor (12) which extends along the length of the cable; a separation layer (17) which extends along the length of the cable and is interposed between the pair of conductors (15, 16), an outer insulating jacket (column 4, line 9, US 3222497, note, this info from Mills reference) extending along the length of the cable and around the first and second conductors and the separation layer wherein the first and second conductors are connected at a first end of the cable in series (as shown in Figures 2-3).

C. "…separation layer has [NTC]…first conductor has a [PTC]…"

With respect to separation layer having negative temperature coefficient, Sopory clearly teaches use of separation layer having negative temperature coefficient. Mills discloses a heater cable as shown in Figures 2 and 3 to generate heat using AC current, equal current flows in opposite direction. The combination of prior art is proper because, (a) Combining prior art elements according to known methods to yield predictable results; (b) Simple substitution of one known element for another to obtain predictable results; (c) Use of known technique to improve similar devices (methods, or products) in the same way; (d) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) " Obvious to try " – choosing from a finite number

of identified, predictable solutions, with a reasonable expectation of success; (f) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; (g) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

D. Other Cited references

According to appellant, GordonJr Fail to disclose, "when the first and second conductors are connected at a second end of the cable to an AC power supply equal currents flow in opposite directions through adjacent portions of the first and second conductors…." Examiner never stated that Gordon Jr discloses such feature.

Gordon Jr reference was utilized in *35 USC § 103 claim Rejections.-*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The combination of prior art is proper because, (a) Combining prior art elements according to known methods to yield predictable results; (b) Simple substitution of one known element for another to obtain predictable results; (c) Use of known technique to improve similar devices (methods, or products) in the same way; (d) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) " Obvious to try " – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (f) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;

(g) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Vinod D. Patel/

Examiner, Art Unit 3742

Conferees:

/Henry Yuen/

Supervisory Patent Examiner, TC 3700

/TU B HOANG/

Supervisory Patent Examiner, Art Unit 3742